Various Stepper motor options

Motor with litz cables

Litz motors are the least expensive and the most common stepper motors. The connecting wires for this type directly exit from the housing. They are preferably installed in machines and equipment that have an additional housing or are used in clean environments.

Motor with connector

The connector interface provides a high IP65 protection level (IP: International Protection). The higher the IP rating, the better the motor is protected from the ingress of dirt and water.

Motor with connector and encoder

The encoder sends signals from the motor to the motor control. The encoder verifies that the required linear motion has occurred precisely as required.
Encoder = increased machine reliability.

Motor with connector, encoder and brake

The brake can hold the payload in position when the motor is not under power. This is used as a safety feature during power failures – recommended for vertically mounted systems.

Installation sizes of NEMA Stepper motors

NEMA11: Tiny but with plenty of power

This motor has very compact dimensions. Even so, heavy loads can be moved with the suitable lead screw pitch. This motor is typically used on small test and analysis equipment and miniature adjustments.

- The holding moment, Mo, is 0.13 Nm
- The connection size is 28 x 28 mm

NEMA17: Small, but lots of power

This little motor has impressive torque and high RPMs.
Reliable operation at fast travel with low loads

- The holding moment, Mo, is 0.5 Nm
- The connection size is 42 x 42 mm

NEMA23: The best known stepper motor size

Versatile choice due to the high torque and rotational speed.
This motor is the best choice for most applications with medium loads.

- The holding moment, Mo, is 2.0 Nm
- The connection size is 56 x 56 mm

NEMA23XL: The power motor in the medium installation size

A development extension of the typical NEMA23 with nearly twice the torque.
The assembly dimensions are identical to the NEMA23, allowing many applications

- The holding moment, Mo, is 3.5 Nm
- The connection size is 60 x 60 mm

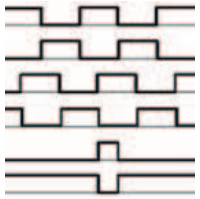
NEMA34: The power pack in the large installation size

Applications with higher loads are implemented using the largest installation size.
Heavy-duty format adjustments or parallel dual axis setups are among its primary duties

- The holding moment, Mo, is 5,9 Nm
- The connection size is 86 x 86 mm

Technical Data

Distance over hubs		28	42	56	60	86
Motor		**NEMA11**	**NEMA17**	**NEMA23**	**NEMA23XL**	**NEMA34**
Maximum voltage	[VDC]	60	60	60	60	60
Nominal voltage	[VDC]	24-48	24-48	24-48	24-48	24-48
Nominal current	[A]	1.0	1.8	4.2	4.2	6.4
Holding torque	[Nm]	0.13	0.5	2.0	3.5	5.9
Ratchet torque	[Nm]	0.004	0.022	0.068	0.075	0.210
Step angle	°	1.8	1.8	1.8	1.8	1.8
Resistance/phase	[Ω]	2.30 ±10%	1.75 ±10%	0.5 ±10%	0.65 ±10%	0.33 ±10%
Inductivity/phase	[mH]	1.40 ±20%	3.30 ±20%	1.90 ±20%	3.20 ±20%	3.00 ±20%
Mass moment of inertia - rotor	[kgcm²]	0.02	0.08	0.48	0.84	2.70
Shaft load, axial	[N]	7	7	15	15	65
Shaft load, radial	[N]	20	20	52	63	200
Encoder						
Operating voltage	[VDC]	5				
Signals/rotation	[1/min]	500				
Zero signal/index		yes				
Line driver		RS422 Protocol				
Signal shape (Clock-wise motor rotation)	[CW]	A, A/, B, B/, N, N/				



Distance over hubs			28 (NEMA11)	42 (NEMA17)	56 (NEMA23)	60 (NEMA23XL)	86 (NEMA34)
Brake							
Operating voltage	[VDC]	-		24 ±10%	24 ±10%	24 ±10%	24 ±10%
Output rating	[W]	-		8	10	10	11
Holding torque	[Nm]	-		0.4	1.0	1.0	2.0
Mass moment of inertia	[kgcm²]	-		0.01	0.02	0.02	0.07

Distance over hubs		28 (NEMA11)	42 (NEMA17)	56 (NEMA23)	60 (NEMA23XL)	86 (NEMA34)
Weight						
Product weight	[kg]	0.25	0.32	1.12	1.56	3.20
With Encoder	[kg]	0.27	0.34	1.14	1.58	3.30
With Encoder and brake	[kg]	-	0.58	1.36	1.82	3.60

Operating data		
Ambient temperature	[°C]	-10 to +50
Max. allowable temp. increase	[°C]	80
Insulation class		B
Air humidity (non condensing)	[%]	85
IP rating – motor housing		IP65 (shaft seal IO52, litz wire motor IP40)
CE conformity		EVM directive

characteristic curves

Flange size 28 (NEMA11)

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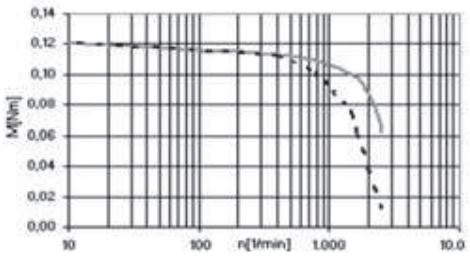

Flange size 42 (NEMA17)

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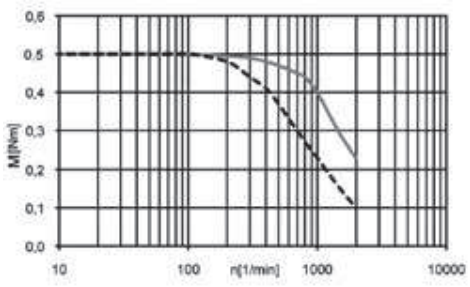

Flange size 56 (NEMA23)

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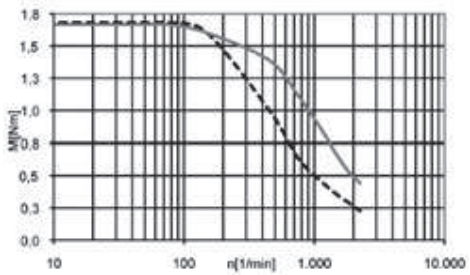

Flange size 60 (NEMA23XL)

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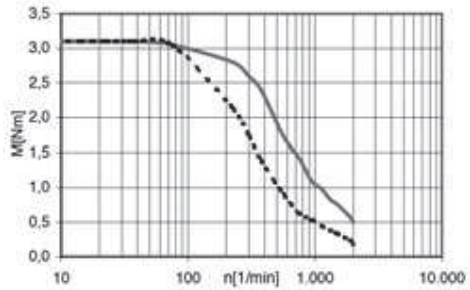

Flange size 86 (NEMA34)

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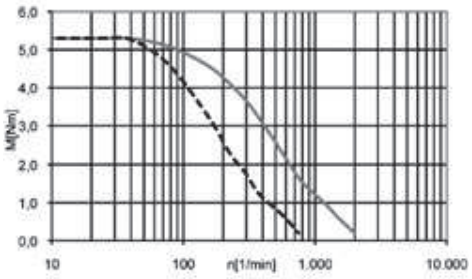

------- 24 VDC ——— 48 VDC

The characteristic progressions are determined in quarter step mode

Order key:

MOT-AN-S-060-020-056-M-A-AAAA

Specification
- **AAAA:** Standard
- **AAAC:** Encoders
- **AAAD:** Encoder & brake

Options
- **A:** Without
- **C:** Incremental encoder
- **D:** Incremental encoder & brake

Motor connection
- **M:** Metric connector
- **L:** Litz wires

Distance over hubs
- **028:** 28 mm (NEMA11)
- **042:** 42 mm (NEMA17)
- **056:** 56 mm (NEMA23)
- **060:** 60 mm (NEMA23XL)
- **086:** 86 mm (NEMA34)

Holding torque
- **001:** 0.1 Nm
- **005:** 0.5 Nm
- **020:** 2.0 Nm
- **035:** 3.5 Nm
- **059:** 5.9 Nm

Maximum voltage
- **060:** 60 V/DC

Motor type
- **S:** Stepper motor

Type
- **AN:** Design

Product type
- **MOT:** Motor

More information ▶ www.igus.eu/eu/drylinE